Thin Film Metallized Plates - Custom Substrates

FEATURES

- Metalization on 1, 2, or 6 surfaces
- Various substrate materials
- Tantalum nitride or nickel chromium resistor material
- Sputtered / plated metal systems
- Sizes from 0.020" x 0.020" to 4.500" x 4.500"
- High volume
- Quick delivery available

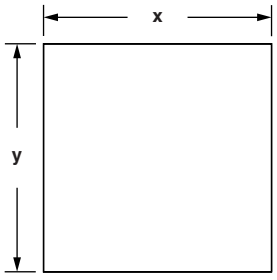
APPLICATIONS

Vishay EFI metalized plates can be used as stand-offs, jumpers or bonding pads in hybrid packages when diced to small sizes; they are also available with no metallization (bare ceramic) for use as spacers or insulators. Larger sized plates can be used where the customer wants to pattern and etch substrates in-house.

SUBSTRATE MATERIALS

MATERIAL CODE	MATERIAL	SURFACE FINISH (µ" CLA)		APPLICATION
A	Alumina (99.6)	A L P	< 3 front / < 4 back as-fired < 12 lapped < 1 polished	Cost effective material with wide range of applications
B	Beryllium oxide	L P	15 to 40 lapped < 3 polished	Highest thermal conductivity (285 W/mC)
N	Aluminum nitride	L P	10 to 20 lapped < 2 polished	High thermal conductivity (170 W/mC)

PLATE SIZE



X (mils)	Y (mils)
20	20
50	50
100	100
200	200
500	500
1000	1000
2000	2000
4500	4500

Note

- For any plates smaller than 1.000" x 1.000" or where plate size is not available, metal is only available on one or two surfaces (front or back)

RESISTOR MATERIAL

Typical reasons for using NiCr resistor material are for long term stability and high sheet rho. Typical recommended uses for TaN are for non-hermetic applications where self-passivation is important.

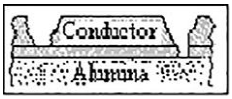
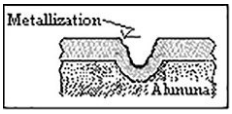
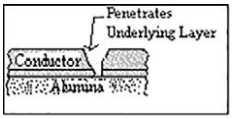
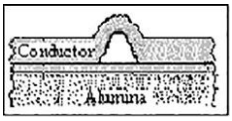
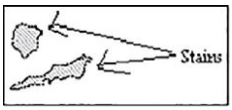
RESISTOR MATERIAL			
RESISTOR CODE	**RESISTOR MATERIAL**	**SHEET RHO (Ω/SQ) ± 20 %**	**TCR (ppm/°C) TYPICAL VALUES**
A	NiCr	25	± 50
B	NiCr	50	± 100
C	NiCr	100	± 200
D	NiCr	200	± 250
1	TaN	25	± 50
2	TaN	50	± 100
3	TaN	75	± 250

METAL STACK			
METAL CODE	**METAL STACK**	**TYPICAL APPLICATION**	**TYPICAL ATTACHMENT METHOD**
1	TiW (500 Å to 1000 Å) / Au (50 µ" min.)	Au and Al wirebondable	Epoxy
2	TiW (500 Å to 1000 Å) / Au (100 µ" min.)	Au and Al wirebondable	Epoxy
3	TiW (500 Å to 1000 Å) / Au (15 µ" to 40 µ") / Ni (20 µ" to 80 µ") / Au (50 µ" min.)	Au and Al wirebondable and solderable	Epoxy or solder
4	TiW (500 Å to 1000 Å) / Au (15 µ" to 40 µ") / Ni (20 µ" to 80 µ") / Au (100 µ" min.)	Au and Al wirebondable and solderable	Epoxy or solder
5	TiW (500 Å to 1000 Å) / Pd (1500 Å to 2500 Å) / Au (50 µ" min.)	Au and Al wirebondable and solderable	Epoxy or solder
6	TiW (500 Å to 1000 Å) / Pd (1500 Å to 2500 Å) / Au (100 µ" min.)	Au and Al wirebondable and solderable	Epoxy or solder
7	Cr (500 Å to 1500 Å) / Cu (5000 Å to 7000 Å) / Au (100 µ" min.)	Au and Al wirebondable	Epoxy
8	Cr (500 Å to 1500 Å) / Cu (500 u" min.) / Ni (20 µ" to 80 µ") / Au (100 µ" min.)	Au and Al wirebondable and solderable. High power applications for low metal resistivity	Epoxy or solder

VISUAL INSPECTION

VEFI uses internal visual inspection criteria as shown in the table below for metal non-patterned substrates. For any plates smaller than 1.000" x 1.000" or where plate size is not available, metal burrs will be acceptable along part edges where plates are sawn to size.

SURFACE PERFECTION INSPECTION CRITERIA (1)

SCHEMATIC ILLUSTRATION	DEFECT TYPE	DEFECT SIZE	FRONT (2)	BACK (3)
	NODULES BUMPS	> 10 mil dia. (>0.254 mm)	0.25/sq"	0.25/sq"
		5 mil to 10 mil dia. (0.127 mm to 0.254 mm)	1/sq"	2/sq"
		3 mil to 5 mil dia. (0.076 mm to 0.127 mm)	3/sq"	6/sq"
		2 mil to 3 mil dia. (0.05 mm to 0.076 mm)	3/sq"	6/sq"
		< 2 mil dia. (< 0.05 mm)	NIF	NIF
	METALIZATION VOIDS PINHOLES	> 2 mil dia. (> 0.05 mm)	None	None
		1 mil to 2 mil dia. (0.0254 mm to 0.05 mm)	5/sq"	10/sq"
		< 1 mil high (< 0.0254 mm)	NIF	NIF
	CRATERS DEPRESSIONS (hole into ceramic)	> 10 mil dia. (> 0.254 mm)	None	None
		5 mil to 10 mil dia. (0.127 mm to 0.254 mm)	1/sq"	3/sq"
		2 mil to 5 mil dia. (0.05 mm to 0.127 mm)	4/sq"	4/sq"
		1 mil to 2 mil dia. (0.0254 mm to 0.05 mm)	15/sq"	15/sq"
		< 1 mil dia. (0.0254 mm)	NIF	NIF
	SCRATCHES (4) (excluding surface abrasions)	> 1/2 mil wide (> 0.0127 mm)	1/sq"	NIF
		< 1/2 mil wide (< 0.0127 mm)	NIF	NIF
	BLISTERS	> 10 mil dia. (> 0.254 mm)	None	None
		5 mil to 10 mil dia. (0.127 mm to 0.254 mm)	1/sq"	1/sq"
		2 mil to 5 mil dia. (0.05 mm to 0.127 mm)	2/sq"	2/sq"
		1 mil to 2 mil dia. (0.0254 mm to 0.05 mm)	4/sq"	4/sq"
		1/2 mil to 1 mil dia. (0.0127 mm to 0.0254 mm)	6/sq"	6/sq"
		1/4 mil to 1/2 mil dia. (0.006 mm to 0.0127 mm)	16/sq"	16/sq"
		< 1/4 mil dia. (< 0.006 mm)	NIF	NIF
	STAINS-SPOTS (5)	> 4 mil. (> 0.1 mm)	None	None
		2 mil to 4 mil (0.05 mm to 0.1 mm)	1/sq"	2/sq"
		1 mil to 2 mil (0.0254 mm to 0.05 mm)	2/sq"	4/sq"
		< 1 mil (< 0.0254 mm)	3/sq"	5/sq"

Notes

- NIF = not inspected for

(1) Exclusion area for 1" x 1" and greater plates: Front and Rear: 100 mils (2.54 mm) from substrate edge
(2) A-face 100 % inspection method: 3x to 8x magnification. Higher magnification may be used for defect verification
(3) B-face 100 % inspection method: Unaided eye. Higher magnification may be used for defect verification
(4) Scratch or probe mark exposing underlying material that is > 200 mils long
(5) Contamination: Not removable by distilled water or common solvents

GLOBAL PART NUMBER INFORMATION

Standard Global Part Number: SPF1AA02021A11BX

Global Part Number Description: SPF1 Al_2O_3 As-Fired 20 mils x 20 mils 10 mils Thick NiCr 25 Ω/sq Front: TiW / Au (50 µ" min.) Back: TiW / Au (50 µ" min.) BX

S	P	F	1	A	A	0	1	0	1	1	A	1	1	B	X

MODEL	MATERIAL	FINISH	PLATE SIZE X (MILS)	PLATE SIZE Y (MILS)	THICKNESS (MILS)	RESISTOR	METAL FRONT	METAL BACK	PACKAGING CODE
SPF1	**A** = Al_2O_3 **B** = BeO **N** = AlN	**A** = as-fired **L** = lapped **P** = polished	**02** = 20 **05** = 50 **10** = 100 **20** = 200 **50** = 500 **11** = 1000 **21** = 2000 **45** = 4500	**02** = 20 **05** = 50 **10** = 100 **20** = 200 **50** = 500 **11** = 1000 **21** = 2000 **45** = 4500	**1** = 10 **2** = 15 **3** = 20 **4** = 25	**N** = none Otherwise see Resistor Material table	**N** = none Otherwise see Metal Stack table	**N** = none Otherwise see Metal Stack table	**BX** = box 1 min. / 1 mult. **W1** = waffle pack 1 min. / 1 mult.

Custom Global Part Number: SPF1 xxxx - xx x

S	P	F	1						-			
MODEL				VEFI ASSIGNED NUMBER						INTERNAL REVISION		VARIANT

A = ALN
B = Be0
0 = coating

Note

- Plates 1" x 1" and greater will be individually packaged in glassine envelopes in the box

CONTACT INFORMATION

For design assistance, contact: efi@vishay.com

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